MARSHALL STAR

Serving the Marshall Space Flight Center Community

Jan. 10, 2002

Marshall awards contract to industry team to design air-breathing rocket engine

by Rick Smith

A new design contract, awarded Dec. 21 by the Marshall Center, is expected to lead to development by 2006 of a ground test version of an air-breathing rocket engine for a next-generation hypersonic flight vehicle.

The industry team that will design the engine — known collectively as the Rocket Based Combined Cycle Consortium, or RBC^3 — includes the Rocketdyne Propulsion and Power business of the Boeing Co., of Canoga Park, Calif.; Aerojet of Sacramento, Calif.; and Pratt & Whitney of West Palm Beach, Fla.

The radical new engine project is called the Integrated System Test of an Air-breathing Rocket, or ISTAR. The flight-like engine system will be designed to accelerate a self-powered vehicle to more than six times the speed of sound, demonstrating all modes of engine operation.

The $16.6 million contract award covers Phase One of the project, which requires completion of conceptual system design and subsystem testing by November 2002. Phase Two, ground testing of the flight-weight engine system, is scheduled to begin in

*See **Rocket engine** on page 9*

Inside the Star

Photo by Doug Stoffer, NASA/Marshall Space Flight Center

NASA, Marshall year in review

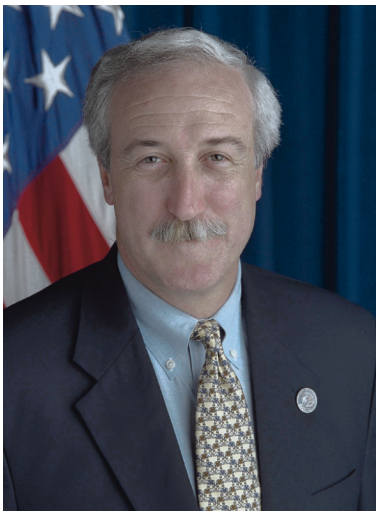
The opening of the Payload Operations Center marked a highlight for Marshall in 2001. Marshall Center Director Art Stephenson, center, calls the International Space Station from the newly opened Payload Operations Center. Alan Johnston, left, the payload communicator manager, helps place the call. NASA Associate Deputy Administrator Dr. Daniel Mulville, right, listens in. For more on NASA and Marshall accomplishments for the past year, see pages 6-7.

Message from NASA Administrator Sean O'Keefe

As we begin a new year, I am honored to be here, working with you as NASA's new administrator.

As we enter 2002, we are sensitive to the events of the past year. The senseless tragedy of Sept. 11 illustrates the fact that there's no true way of telling what a new year will bring.

However, we now have the chance to pause and take stock, and to think about the possibilities of the year to come. As we work today to live with new resolve, let us commit ourselves to ignore the trivial anxieties of life and focus on those things most important — our families and our friends. If the year 2001 taught us anything, it's that every day we are blessed with life, health and love is a good day.



Sean O'Keefe

In the wake of the terrorist attacks, we are all amazed at the extraordinary sense of national resolve that emerged from the destruction in New York, Washington and Pennsylvania. President Bush has inspired a renewed sense of patriotic purpose. And with that sense of purpose, he has instilled in all Americans a resolve to take care of one another.

We also learned that with challenge comes opportunity.

It is up to each and every one of us to exploit the opportunities of 2002.

The strength of this nation's space program comes from your determination. No matter the obstacle, the people of NASA have a legacy of overcoming adversity. It is that deep determination and commitment to excellence that will see us through the challenges of the coming year.

As I move into this new role as NASA administrator, we face a substantial "to do list." It's going to require a lot of hard work and some difficult decisions. But with you, I know we will reinvigorate the agency's mission of discovery and conquer new challenges.

NASA leads a unique expedition that is vital to the future security and vitality of our nation and humanity.

As we celebrate this season of renewal, let us resolve to face the problems, step up to the challenges, exploit the opportunities, and continue to pioneer the frontiers of air, space and knowledge. In 1899, Theodore Roosevelt said, "Far better it is to dare mighty things, to win glorious triumphs, even though checkered by failure, than to take rank with those poor spirits who neither enjoy much nor suffer much, because they live in the gray twilight that knows not victory nor defeat."

And in the words of Todd Beamer, that heroic American who thwarted the hijackers of United Airlines Flight 93 on Sept. 11, "Let's roll!"

Center director looking for continued patriotism, appreciation for people in 2002, through Marshall Values

Director's Corner

As we enter a new year, it is important to reflect on the lessons of the past year and to set goals for the year ahead. I have learned the power of setting personal and professional goals. It is amazing how the human subconscious works to guide us toward goals we believe we can achieve.

When we think of 2001, I am sure we will, for years to come, zero in on the Sept. 11 terrorist attacks on America, and the tragedy it brought to the many families who lost loved ones. We will also remember the heroes that rose to the occasion and sacrificed themselves as they tried to help others. We will remember how our nation rallied in response and came together to overcome this tragedy. We have experienced a change in our appreciation for our family members, friends, neighbors, business colleagues and all those who are a part of our nation.

Thinking ahead to 2002, I am hopeful that our renewed patriotic attitude and appreciation for people continues. I am also keenly interested in knowing that you, the Marshall team, embrace our Center Core Values that capture these lessons learned from 2001. Read them over and see if you can commit to them as guideposts for yourself as you make business decisions and choose what behavior you will display in a given situation. Later this month, we will be making available badge cards that have our Marshall Values printed on them. I hope you will take one and put it with your badge and refer to it from time to time. I am asking you to make one of your 2002 goals a commitment to perform your work using the Marshall Center's Core Values as a guide for your decisions and behavior.

I am convinced that if we live each day with these values in mind we will succeed in our efforts to make a significant difference in "Bringing People to Space and Bringing Space to People."

Thanks in advance for your support in creating a values-based culture at Marshall.

— Art Stephenson,
Marshall Center Director

Forum on Jan. 15

Public meeting on proposed propulsion labe set

On Dec. 23, officials at the Marshall Center issued a study assessing the environmental impact of a proposed NASA research facility to be constructed in 2002.

The world-class Propulsion Research Laboratory complex — a multi-million-dollar, state-of-the-art facility for advanced scientific study of propulsion concepts and technologies — is scheduled to begin construction next April, pending the findings of the Environmental Assessment team.

The publication of the Environmental Assessment marks the start of a 30-day public comment period, which ends Jan. 22. The Marshall Center will host an open forum Jan. 15 to address the public's questions about the new facility.

"We encourage Huntsville and Madison County residents to review the document and attend the forum if they have questions," said Mike Reynolds, a Marshall Center environmental engineer. "We're confident the environmental assessment demonstrates that the new propulsion laboratory will be a safe, secure and environmentally friendly facility. It's designed as a home for cutting-edge research that benefits NASA's mission and continues to ensure America's leadership in space."

The public meeting will be held Jan. 15 at 6:30 p.m. at the Huntsville-Madison County Public Library on Monroe Street in downtown Huntsville. Citizens are welcome to attend.

The Environmental Assessment draft document will be available for review at all branches of the library. The public may obtain a copy by calling, writing or sending an e-mail to:

Shar Hendrick, Manager
Government & Community Affairs Department
Marshall Space Flight Center
Huntsville, AL 35812
(256) 544-2030
shar.hendrick@msfc.nasa.gov

Once the comment period has ended, a final version of the Environmental Assessment will be made available to the public in February.

Like all government organizations, NASA conducts environmental assessment studies for any construction or building project or activity that may impact the environment or human communities in its vicinity.

More about the Propulsion Research Laboratory

The Propulsion Research Laboratory, to include 66,000 square feet of usable space, will be housed on a 21-acre site on Redstone Arsenal. The site is bordered by Marshall Road North, Neal Road, Morris Road, and a shared boundary with Redstone Arsenal property.

The facility, expected to be completed in April 2004, is vital for developing the advanced propulsion technologies needed to open up the space frontier, and will set the stage for research that could revolutionize space transportation for a broad range of applications. Research and subscale experiments supporting cheaper, more efficient and safer access to space will be conducted in a number of areas, including solar energy, advanced chemical propulsion technologies, and processes based on fission, fusion and antimatter.

Marking 100th anniversary of Wright Brothers' first flight

Flight Commission unveils plan for 2003 celebration

NASA news release

The U.S. Centennial of Flight Commission (COFC) recently issued its national plan for the 100th anniversary of the Wright brothers' first flight. As momentum builds for the 2003 celebration, organizers are working on festivities from coast to coast under the campaign theme "Born of Dreams — Inspired by Freedom."

"We believe these six words capture the spirit of the Wright brothers' drive and determination to conquer powered flight," said Sherry Foster, executive director, U.S. Centennial of Flight Commission. "The Wright brothers' discovery continues to change the world we live in. This celebration will pay tribute to their accomplishments and those who have pioneered flight for the past 100 years."

Numerous federal, state and private organizations are involved in the effort. Activities and events planned for the yearlong celebration include plane races, cross-country Wright Flyer tours, blimp events, international symposiums, special art displays, attempts at aviation world records, gas balloon races, an international aviation world's fair and special museum exhibits, as well as events by the U.S. Air Force, IMAX Films, NASA and the Smithsonian National Air and Space Museum.

The festivities will culminate on the Outer Banks of North Carolina on Dec.17, 2003, with an authentic recreation of the Wright brothers' first flight on the sand dunes near Kitty Hawk.

"The Centennial celebration will offer activities for Americans of all ages," said Commission Chairman General J.R. ("Jack") Dailey. "We want people all over this country to rekindle their fascination with flight and to look upon this Centennial as a celebration of our freedom to reach for our dreams."

The Commission is working on plans for a kick-off event in Washington on Dec. 17, 2002. A complete listing of all centennial activities and more information on the commission can be found at: *www.centennialofflight.gov*

More information also is available from Christian Markow, at (804) 675-8153.

Marshall Center sponsoring three teams

NASA supports 200 high schools in robotics competition

NASA news release

NASA and its corporate partners will support robotics education for about 200 high schools next year by sponsoring teams that will participate in a national robotics competition.

The NASA-sponsored teams will join hundreds of others in constructing robots that will compete in regional contests and a final, national competition in April at Walt Disney World's EPCOT Center in Orlando, Fla. Students at the competing schools will be challenged to design a robot that will complete a specified set of tasks within rules outlined Jan. 5.

The Marshall Center is sponsoring three teams: Lee High School in Huntsville; Arab High School; and Lincoln County High School in Fayetteville, Tenn. Marshall engineers are also helping students at New Century Technology High School in Huntsville. New Century will not receive any money from the Marshall Center.

"Education is key to the success of our country, and this approach represents one of the most powerful ways to get students motivated," said Mark Leon, project manager of the Robotics Education Project at NASA's Ames Research Center at Moffett Field, Calif. "Some of these students may go on to help NASA engage in bold new missions of exploration of our solar system. The idea here is to involve students in hands-on activities to turn them on to science and math."

The robotics project kicked off Jan. 5 at the Verizon Center in Manchester, N.H., with a demonstration of the task for this year's regional and national competitions. Rules, goals and other details, such as the layout of the playing field, were revealed during NASA TV's broadcast of the ceremony. Detailed requirements of the robotic games are carefully guarded until announced at the kickoff event.

Following the ceremony, students and their advisers will have six weeks to design and construct remote-control robots, using identical kits of material.

The annual nationwide robotics competition is conducted by the non-profit FIRST (For Inspiration and Recognition of Science and Technology) organization in Manchester and sponsored by NASA and a number of corporations. Each year FIRST presents a game problem and identical parts kits to each team. The teams, composed of high school students and professional engineers and scientists, work together to construct their robots for the competition. The engineers come from NASA, private industry, other government agencies and universities.

Students also will organize marketing, public relations, fund-raising and management groups to compete for the award-winning solution. Each year's competition is different, so returning teams always have a new challenge.

NASA-sponsored teams will receive a total of about $1.5 million. Each school received a $5,000 credit toward registration fees, and about $1,000 for travel to the kickoff ceremony. The group of NASA-sponsored teams includes many from disadvantaged schools. For a complete list of the awards issued by NASA, see:
http://robots.larc.nasa.gov/

A complete list of the regional events, corporate sponsors and other details are included on the FIRST Web site at:
http://www.usfirst.org/

FIRST was started in 1989 by inventor Dean Kamen to persuade American youth that engineering and technology are exciting fields. The annual robotics competition is patterned after Massachusetts Institute of Technology professor Woodie Flowers' engineering design course. NASA participation in the FIRST program is provided through the NASA Office of Space Science and is directed by Dave Lavery.

Courtesy photo

Students from schools sponsored by the Marshall Center watched last Saturday's FIRST Robotics kickoff ceremonies at the University of Alabama in Huntsville.

John White, Harold Bencaz retire from Michoud Assembly Facility

As the New Year gets under way, employees at Marshall's Michoud Assembly Facility near New Orleans, may notice the absence of two long-time co-workers.

John White, NASA resident manager of the Michoud facility, with 32 years service, and Harold Bencaz, senior project engineer in the External Tank Resident Office at Michoud, with 44 years service, retired Jan. 3. Bencaz is a Marshall Center Charter Member.

John White

Harold Bencaz

White began his career at Marshall in 1967 as a tool design engineer in the Manufacturing Engineering Laboratory, doing design and manufacture of flight experiments. In 1974, he was assigned to the Structures and Propulsion Laboratory where he performed structural analysis of flight vehicles and associated hardware.

White became the External Tank chief engineer's representative at Michoud in 1977, where he significantly influenced the design, analysis and resolution of production problems on the External Tank Project. In December 1994, he became manager of the Michoud facility.

Born in Miami, White earned a bachelor's degree in mechanical engineering from Louisiana Technical University in Ruston in 1967, and a master's in administrative science from the University of Alabama in Huntsville in 1973. He and his wife, Harriet, have two sons and live in Slidell, La.

Bencaz, born in Maurepas, La., graduated from Southeastern Louisiana University in 1957 with a bachelor's degree in physics. Following graduation, he was employed by Western Electric Corporation as an associate engineer working on the SAGE air defense system for the Department of Defense at Lincoln Laboratories of Massachusetts Institute of Technology.

In 1958, he went to work for Army Ballistic Missile Agency/Guidance and Control Lab working in the area of flight dynamics and control systems for Pershing and Jupiter Missiles. In July 1960, he became a charter member of the Marshall Center with 4,670 other colleagues.

In 1963, Bencaz transferred to Michoud with responsibilities in project management for the engineering and manufacturing activities of the Saturn IB and Saturn S-IC stages. In 1973 with the advent of the Space Shuttle Program, he became responsible for the monitoring of the engineering, manufacturing and project management activities of the External Tank Project.

Bencaz and his wife, Carly, have two daughters.

Energy tip

Use a programmable thermostat to control heating system

Your heating and cooling system consumes more than half of the energy in your home. What can you do to reduce your energy consumption with your thermostat? If you don't adjust the thermostat when you leave the house or go to bed, you have an opportunity to save dollars.

A programmable thermostat automatically coordinates the temperature of your home with your daily and weekly (weekend) patterns — so you don't have to awaken to a chilly bedroom in winter or come home to a stuffy house in summer. Once you make the settings, you don't have to adjust the thermostat again.

When adding a programmable thermostat or replacing a furnace, air conditioner or heat pump, look for the Energy Star label. Additional information can be obtained from the yellow Energy Guide label to compare every model in a category, its capacity and estimated yearly energy cost.

Rule of thumb for thermostat savings: For each degree you lower your thermostat in winter, you can save about 3 percent on your heating bill. An Energy Star furnace could save $1,700 relative to an old furnace, or $1,000 over the lifetime of a standard new furnace.

If you have an energy tip that you would like to share with the "Marshall Star" readers, send it to: *Cedreck.davis@msfc.nasa.gov* or *Juergen.Haukohl@msfc.nasa.gov*

Marshall's year in review

The Marshall Center saw many accomplishments in 2001. Funding for Space Launch Initiative ranked among the top NASA highlights.

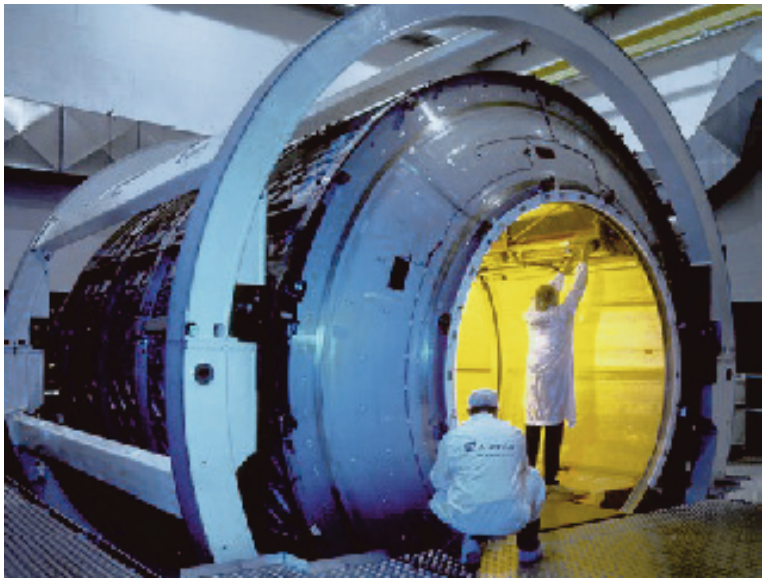
The following is a chronological look at a few of the highlights of 2001 taken from issues of the "Marshall Star."

Starship 2040

Starship 2040 embarked on its maiden voyage in January. Starship 2040 is a traveling NASA exhibit housed in a 48-foot trailer and tractor rig that invites the public to experience what commercial spaceflight might be like four decades from now — in 2040. Visitors walk through a full-sized, hands-on mock-up of the spacecraft's control, passenger and engineering compartments.

Logistics modules

A Marshall team, under direction from Johnson Space Center, designed, developed, tested and evaluated three multi-purpose logistics modules to be used to transport laboratory racks of equipment, supplies and experiments to and from the International Space Station. The modules, named for famous Italian engineer/artists Leonardo Da Vinci, Raffaello Sanzio and Donato "Donatello" di Nicolo di Betto Bardi, were built in Italy. The Marshall Center also is responsible for the analytical integration of the racks prior to each flight.



Inspectors check a multi-purpose logistics module prior to shipment.

Payload Operations Center

On Feb. 2, the Marshall Center opened the Payload Operations Center — NASA's command and control center for scientific research onboard the International Space Station. Throughout the life of the Space Station, the operations center will be staffed around the clock by three shifts of 13-19 flight controllers. The operations center integrates research requirements, plans science missions and ensures they are safely executed. It integrates crew and ground team training and research mission timelines. It manages use of Space Station payload resources, handles science communications with the crew, and manages commanding and data transmissions to and from the Space Station.

ISO Audit

The Marshall Center passed all its ISO audits in 2001 and has been recommended for certification to the newest standard: 9001/2000.

X-33 and X-34 contracts end

The president's budget blueprint for NASA included funds for the Space Launch Initiative, but that budget did not include funds for the X-33 and X-34 vehicles. The X-33 program ended when the cooperative agreement between NASA and Lockheed Martin expired on March 31. At the time of the announcement, NASA already was ending its X-34 contract with Orbital Sciences Corp.

X-40A tests successful

The X-40A experimental vehicle, part of the Marshall-managed X-37 program, was successfully tested during a series of free flight tests beginning in March. The flight tests — conducted in partnership with the U.S. Air Force — were used to validate several technologies planned for use on the X-37 vehicle.

Block II main engine

The new Space Shuttle Main Engine — the Block II configuration — was completed. The first new engine was installed on Space Shuttle Atlantis, April 24, at Kennedy Space Center in Florida, for launch June 14 on mission STS-104. Improvements to the main engines, managed by the Marshall Center, continue to evolve to produce the safest, most reliable and reusable space transportation system in the world.

National tragedy

Marshall Center and Redstone Arsenal employees were sent home as a safety precaution following the terrorist attacks on New York and Washington, D.C., Sept. 11. The Center remained closed while new security measures were implemented at the Arsenal gates.

Balancing Marshall Workforce

An overload in work requirements for many Marshall employees prompted Center Director Art Stephenson to commit to Balancing the Marshall Workforce. Balancing the Marshall Workforce is intended to reduce unacceptable levels of stress in areas across the Center, both in programs and support organizations.

Marshall-managed SLI program recognized as future technology

2001: A year of challenge and accomplishment for NASA

NASA news release

As NASA's space odyssey for 2001 comes to an end, the agency faces a year of transition and new challenges as it prepares to continue its mission of discovery into the new millennium.

In the last year, the International Space Station, the largest and most sophisticated spacecraft ever built, celebrated its first full year of human habitation. The successful arrival of NASA's Mars Odyssey at the red planet energized space scientists and, for the first time, NASA was able to create a complete biological record of Earth.

In 2001, the Space Shuttle turned 20 as NASA launched a new initiative to find better and cheaper access to space, all while facing new fiscal realities that could fundamentally change the way the agency does business.

"The people of NASA have much of which to be proud as we reflect on the agency's accomplishments in 2001," said former Acting Administrator Dr. Daniel R. Mulville. "Our future challenges are formidable, but our resolve to overcome those challenges is equally intense. In 2002, NASA will continue its mission to expand air and space frontiers with renewed vigor."

Change of NASA leadership

For the first time in nearly a decade, NASA will have new leadership.

President George W. Bush nominated Sean O'Keefe, the deputy director of the Office of Management and Budget, to be the agency's new administrator. Daniel S. Goldin, the longest-serving administrator in NASA's history, resigned in November after serving more than nine years under three American presidents. During the transition, Mulville, NASA's associate deputy administrator was appointed acting administrator.

Flags for heroes and families

The tragic events of Sept. 11 brought the nation together with a new sense of pride and determination. Expedition Three Commander Frank Culbertson was the only American not on Earth the day of the attacks and documented visible signs of the destruction from the International Space Station. To honor those heroes killed and seriously hurt in New York, Washington and Pennsylvania, NASA sent more than 6,000 American flags into space aboard the Space Shuttle Endeavour. The flags will be distributed to the victims and their families.

NASA'S Mars program sees red

The agency's Mars exploration program rebounded in 2001 when Mars Odyssey successfully entered orbit around the red planet following a six-month, 286-million mile journey. NASA's Mars Global Surveyor sent back its 100,000th image of the Martian surface. The orbiter has been snapping dramatic images for four years. In 2001, Mars Global Surveyor, in tandem with the Hubble Space Telescope, had a ringside seat to the largest global dust storm on the Martian surface seen in decades.

The search for universal life

Is there life on another world? In 2001, astronomers using the Hubble Space Telescope measured the atmosphere of a planet outside our solar system. Astronomers funded by NASA and the National Science Foundation discovered eight new extrasolar planets that have circular orbits, similar to the orbits of planets in our own solar system. Also, NASA's Submillimeter Wave Astronomy Satellite provided the first evidence that there are water-bearing worlds beyond our solar system.

Remote sensing sees a climate change

NASA announced the creation of the first complete "biological record of Earth" by using data from NASA's Sea-viewing Wide Field-of-View sensor. Researchers also suggested the Earth is becoming a greener greenhouse, determining that plant life in the northern latitudes has been growing more vigorously since 1981. In February, NASA released a new map of Antarctica made from Radarsat data. Using the new maps and comparing them to maps produced in 1981, scientists will track Antarctic ice changes, a key to understanding our global environment and climate change. In 2001, NASA research also suggested that desert dust in the atmosphere over Africa might actually inhibit rainfall in the region, contributing to drought conditions.

NASA comes down to Earth

In 2001, NASA announced a commercial partnership that will allow placement of advanced global positioning technologies in farm equipment.

The technology will be used to help farmers navigate fields in poor weather and at night. Throughout the summer of 2001, NASA satellites tracked the devastating spread of wildfires around the western United States, helping federal, state and local governments mitigate these natural disasters.

NASA research benefits life on Earth

Using lasers developed by NASA, researchers discovered a way to bring a beam of light to a stop, store it, and then send it on its way. The discovery could lead to next-generation technologies, such as increasing the speed of computers. A revolutionary early breast cancer detection tool based on NASA technology began human clinical trials in November.

The technology may one day allow physicians to diagnose

*See **NASA** on page 10*

Retired NASA engineer lends experience to help upgrade Huntsville Hospital facilities

by Debra Valine

Retiring in 1995 from NASA, after working as an aerospace engineer for the Space program and Army for 44 years, Bill Dickson knew he would not be able to sit at home and watch television for the rest of his life.

He wanted to stay busy.

Since retiring, Dickson has been a volunteer consultant for the Huntsville Hospital's Support Services Division. He draws on his NASA experience to advise designers working on upgrading Huntsville Hospital facilities, which include a new tram system that will begin operation once testing is completed in about 60 days.

Dickson, a native of the Mississippi Delta, started working at Redstone Arsenal for the U.S. Army in 1951. He had his bachelor's degree in mechanical engineering from Mississippi State University. The Army was desperately seeking young engineers to develop guided missile systems.

When NASA was formed in 1960 and made separate from the U.S. Army, employees had to choose between being an Army employee or being a NASA employee. Dickson opted to stay with NASA. "I thought Wernher von Braun was the future."

Throughout his NASA years, Dickson helped set up and/or operate several groundbreaking, innovative facilities such as the neutral buoyancy simulator, the X-ray Calibration Facilities, and several thermal vacuum test facilities.

He remembers working with Monkey "Able," one of two monkeys used for early space flight testing, and testing the capsule Able would fly in 1956. "That was my first launch," Dickson said. "Able was a Rhesus monkey, and boy was he mean. He had to be sedated for any contact. The other monkey, 'Baker,' was a squirrel monkey. She was docile and lived for many years."

Dickson also worked with the astronauts who were training in the neutral buoyancy simulator in 1993 for the mission to repair the Hubble Space Telescope's optics. "The Hubble astronauts originally trained in the neutral buoyancy simulator many times, but the critical training took place in late 1993, just prior to the famous repair of Hubble's vision and the replacement of several critical components," Dickson said. "For that particular training, the neutral buoyancy simulator had to be upgraded with a high fidelity underwater Shuttle remote manipulator system and a nitrogen/oxygen air system. This system allowed the crew to simulate the full six-hour spacewalks that would be needed to repair Hubble. The facility modifications and the training had to be completed in less than a year."

He also helped develop and activate both generations of the X-ray Calibration Facility, for High Energy Astronomical Observatory (HEAO) in the mid-1970s and then for Chandra X-ray Observatory in the early 1990s. The first Chandra mirror set was tested in late 1991.

Two or three months before his retirement, Dickson talked about retiring with his physician, Dr. Carl Grote Jr., whose father founded Huntsville Hospital.

"Huntsville Hospital had just bought the facility that became Huntsville Hospital East," Dickson said, "and I thought 'Surely there would be something I could do to help marry the two hospitals together.' When Dr. Grote and I were talking, there was no idea of a tram."

Grote helped facilitate Dickson's transfer from putting together NASA facilities to helping with putting together hospital facilities. He talked with hospital officials, and later, Rudy Hornsby, Huntsville Hospital senior vice president, called Dickson about coming to work with the hospital.

"I agreed to work for nothing because I just wanted something to do," Dickson said. "The first thing they asked me to do was look at ways of improving the worn-out laundry facility."

In 1997, Dickson oversaw the design of the new regional laundry facility that now serves eight hospitals in North Alabama.

*See **NASA engineer** on page 10*

Photo by Emmett Given, NASA/Marshall Space Flight Center

Marshall retiree Bill Dickson, left, talks with Alex McCool, center, manager of Marshall's Space Shuttle Projects Office, and George Hopson, manager of the Space Shuttle Main Engine Project Office, about the new tram system at Huntsville Hospital.

Frequent flyer miles now acceptable for personal use

from the Chief Counsel's Office

Federal employees are now authorized to use promotional items such as frequent flyer miles received on official travel for personal use. This is made possible by The National Defense Authorization Act for Fiscal Year 2002, signed by President Bush on Dec. 28.

The long-awaited employee benefit allows civil service, military and foreign service employees to use frequent flyer miles obtained on government travel for personal use. The benefit is retroactive, allowing federal employees, including retired federal employees, to use miles earned prior to the signing of the bill.

Any promotional benefits or material received from a travel service provider in connection with official travel may be retained for personal use, if such items are obtained under the same conditions as those offered to the general public at no additional cost to the government.

It is the policy of the government that employees generally must travel by coach class accommodations. However, employees may upgrade their transportation class of service at their own expense. Therefore, as frequent traveler benefits may now be retained for personal use, employees may use any frequent traveler benefits earned to upgrade transportation class to premium service.

The regulations governing upgrades to premium airline accommodations continue to be found at the Federal Travel Regulation (FTR) §§ 301-10.123 and 301-10.124. Agencies cannot pay for any upgrades, unless one of the exceptions in these regulations is met. Employees are still required to fly contract air when available and are cautioned to use discretion when using frequent flyer miles.

Employees are reminded of the cash awards program implemented by the Marshall Center in March 2000, for using frequent flyer miles when obtaining an airline ticket. Travelers who collect and use their frequent flyer miles toward official TDY will be awarded 50 percent (not to exceed $500) of what it would have cost the government to purchase the ticket.

For more information on this program, call Tina Walker at 544-7291.

For more information on the frequent flyer miles, call Lisa Hughes at 544-0018.

Rocket engine

Continued from page 1

2006. The engine would be demonstrated in flight by the end of the decade.

The project is funded by NASA, which expects to spend approximately $140 million over six years.

NASA is pursuing air-breathing propulsion in an effort to make future space transportation safer, more reliable and significantly less expensive than today's missions. Spacecraft powered by air-breathing rocket engines would be completely reusable, able to take off and land at airport runways and ready to fly again within days.

The engine would get its initial power boost from specially designed rockets in a duct that captures air, an arrangement that improves performance about 15 percent above conventional rockets. Once the vehicle has accelerated to more than twice the speed of sound, the rockets are turned off and the engine relies solely on oxygen in the atmosphere to burn its hydrogen fuel. When the vehicle has accelerated to more than 10 times the speed of sound, the engine converts to a conventional rocket-powered system to propel the craft into orbit.

Air-breathing — or rocket-based, combined cycle — propulsion is a concept dating to the 1960s. The Marshall Center began pursuing the technology for space-based applications in 1996, and started testing air-breathing rocket engine components in 1997. During that time, NASA's industry partners built and tested several alternative engine configurations.

Now, at NASA's request, the Rocket Based Combined Cycle Consortium — which signed an official teaming agreement in March 2001 — is working to preserve the U.S. high-speed space propulsion industrial base. Over the last four years, alternative engine configurations have undergone more than 360 tests to help define requirements for an integrated engine system. Two of these engines have accumulated more than one hour of test time each — the most accrued on any rocket-based, combined-cycle system. Through this testing, engineers have demonstrated the performance of the engine in all its operating modes and transitions between various modes.

"Testing conducted over the last four years proves that air-breathing propulsion is a viable concept for reaching NASA's goals of making space transportation radically safer, more reliable and more affordable," said Steve Cook, deputy manager of the Marshall Center's Advanced Space Transportation Program, which leads U.S. space transportation technology development activities.

"This is an exciting opportunity to leverage the technical expertise our industry partners have amassed in decades of jet engine and rocket propulsion testing and airframe integration, and I believe it will significantly improve space transportation," Cook said.

The engine will be designed to power a vehicle measuring about 14 feet (4.2 meters) wide and more than 30 feet (9 meters) long. NASA's Langley Research Center in Hampton, Va., leads the vehicle definition effort.

For more information about NASA Space Transportation Systems, visit: *http://www.spacetransportation.com*

The writer, employed by ASRI, supports the Media Relations Department.

Think safety first when heating a home

In efforts to stay warm this winter, it's important to remember that heating equipment is the number one cause of home fires in the United States.

To ensure safety, follow these fire safety tips provided by the National Fire Protection Association:

• Have the fireplace chimney inspected by a professional every winter and cleaned, if necessary. A chemical substance called Creosote forms when wood burns and can build up in a chimney and cause a fire if not properly cleaned.

• Always use a sturdy screen when burning wood.

• Remember to burn wood only. Never burn paper or pine boughs because they can float out of the chimney and ignite the roof or that of a neighboring house.

• If purchasing a factory-built fireplace, select one listed by an independent testing laboratory.

• Be sure to inspect chimney connections and chimney flues of wood stoves at the beginning of each heating season. They should also be cleaned periodically.

• Follow the same safety rules for wood stoves as for space heaters. Burn wood only and be sure the wood stove is placed on an approved stove board to protect floors from heat and hot coals. Be sure to check with the local fire department and check local codes before having a wood stove installed.

NASA engineer

Continued from page 8

He also has participated in studies on the hospital's medical waste system.

"Most of my time has been spent working on the new tram, which by the way, had been Rudy Hornsby's idea," Dickson said. "Huntsville Hospital will become one of two hospitals in the United States with a tram system between buildings. The other is at Duke University in North Carolina. It, like ours, was built by POMA-OTIS Transit Systems, a subsidiary of Otis Elevator Company."

Dickson drew on his NASA experiences to help select the safest, most reliable tram system, at a reasonable cost. The result is two independent, cable-drawn trams that patients and guests can ride for free. Each tram moves back and forth between the hospital's four stations: the Plaza Resource Center/Heart Center, the Franklin Medical Tower and the two hospital facilities. "They work like horizontal elevators," Dickson said.

"There are more high-tech ways to design trams," Dickson said, "but we wanted the safest, most reliable system for the money. These trams do not require an operator. They are computer-driven — using elevator technology — and they can be maintained with normal electro/mechanical and computer skills.

"I love what I do," Dickson said. "I am so blessed to have worked with the greatest people in the world at the Marshall Center and then to find the same camaraderie at Huntsville Hospital."

The writer, employed by ASRI, is the Marshall Star editor.

NASA

Continued from page 7

tumors without surgery. In 2001, NASA and the National Cancer Institute began a three-year program to explore new biomedical technologies to develop and study microscopically small sensors that can detect changes at the cellular and molecular level.

Solar System exploration nears perfection

NASA's Near-Earth Asteroid Rendezvous Shoemaker spacecraft did something it wasn't designed to do when mission managers gently landed the spacecraft on the asteroid Eros after a yearlong orbital mission. In a risky fly-by maneuver, the Deep Space 1 spacecraft successfully navigated past a comet, giving researchers an unprecedented view inside the glowing core of icy dust and gas. During 2001, a NASA-funded research team presented evidence that Earth's most severe mass extinction, an event 250 million years ago that wiped out 90 percent of life, was triggered by a collision with a comet or an asteroid.

Human space flight programs reach milestones

Celebrating its first full year of human habitation, the International Space Station's research odyssey began in 2001 with the launch of the Destiny module, the first science lab delivered to the Station. The Space Station is now the most complex and powerful spacecraft ever built. Facing financial challenges in the coming years, an independent task force produced a report that is expected to help managers get the program back on track. The construction of the International Space Station is made possible by NASA's robust fleet of Space Shuttles. The Shuttle celebrated its 20th anniversary in 2001, having carried more than three million pounds of cargo and more than 600 passengers into space.

Future NASA technology today

In 2001, NASA launched an ambitious multi-billion-dollar initiative designed to develop the technologies needed to build a second-generation reusable launch vehicle. NASA's Space Launch Initiative, or SLI, managed by the Marshall Center, also will identify 21st-century designs that can provide safer, more reliable and less expensive access to space. Instead of rocket fuel, NASA's propeller-driven Helios aircraft used solar energy to help set a world record altitude of 96,500 feet. NASA researchers also tested a revolutionary cockpit display that will offer pilots an electronic picture of what is outside their windows, no matter the weather or time of day. This Synthetic Vision will show terrain, ground obstacles, air traffic and other important data to the flight crew.

NASA Fellowship Program

The NASA Administrator's Fellowship Program has issued its annual call for applications. The length of the program is 18-22 months. For application and eligibility requirements, visit the Web at: *http://www.uncfsp.org/nasa/nafp.* For more information, call Vanessa Suggs at 544-7527. Applications should be forwarded to CD20/Vanessa Suggs no later than Jan. 25.

King Unity Breakfast

The Seventeenth Annual Martin Luther King, Jr. Unity Breakfast will be at 8 a.m. Jan. 21 in the Von Braun Center North Hall. Dr. Kevin W. Cosby, senior pastor of St. Stephen Baptist Church in Louisville, Ky., will speak. For tickets — at $20 each — see Madeline Hereford in the Equal Opportunity Office, Bldg. 4200, room 716.

AIAA meets

Larry French, the founder of Griffon Aerospace and chief designer of the Lionheart aircraft, will speak at the January dinner meeting of the local chapter of the American Institute of Aeronautics and Astronautics (AIAA). His presentation will focus on the design and development of the Lionheart aircraft, and a composite fuel tank being developed for NASA. The meeting will begin at 6:30 p.m. Jan. 17 at the Radisson Suite Hotel, 6000 South Memorial Parkway, in Huntsville. Regular admission is $20, and student admission is $10. Reservations should be made via e-mail with Arloe Mayne at *ArloeWJr@cs.com* (preferred), or by telephone at 881-7124, by noon Jan. 14.

Upcoming classes

Cost Control classes

Remaining classes in the series of project planning and analysis classes being held from 8 a.m.-noon in Bldg. 4200, room G-13E, are Schedule Assessment and Analysis, Jan. 16 and Managing a Technology Program, Jan. 23. The series of 10 classes will be repeated at future dates. Participants interested in attending should register via AdminSTAR. For a list of all training opportunities, visit the "Inside Marshall" Web site.

Clubs and Meetings

Toastmasters International

Clark Everett of Madison Research was the winner in the NASA Lunar Nooners Toastmaster's Club's annual evaluator's contest held recently. The final competition will be held Jan. 17 at the Piccadilly Restaurant at Madison Square Mall. Lunar Nooners meets every Tuesday at 11:30 a.m. in the conference room of the cafeteria in Bldg. 4610. Visitors are welcome. For more information, call Dr. Ruth D. Jones at 544-3191 or send an e-mail to: ruth.jones@msfc.nasa.gov.

Miscellaneous

Retiree history book

The NASA-Marshall Center's Retiree Association book, "50 years of Rockets and Spacecraft" that was scheduled to be released at the end of 2001 has been re-scheduled to be released in summer 2002. Articles by individuals may be contributed until Jan. 31 to: Randy Baumgardner, Editor, Turner Publishing Company, 412 Broadway, P.O. Box 3101, Paducah, KY 42002-3101, or send an e-mail: *randyb_editor@yahoo.com.* To order a copy of the book, send $34.95 to Turner Publishing Company, PO Box 3101, Paducah, KY 42002 by check or money order. Include $6 for shipping.

CFC administrator sought

The local federal coordinating committee for the Tennessee Valley Combined Federal Campaign (CFC) will accept applications for a principle combined fund organization to administer the 2002 Combined Federal Campaign. Applications will be accepted through Feb. 8. Only federations, charitable organizations or a combination thereof are eligible to apply for this position. All applications must be mailed to the CFC Chairperson, AMSAM-CFC, Bldg. 3197, Redstone Arsenal, AL 35898-5795.

NASA Exchange

Ballroom dance lessons

Bronze-level fox trot augmented by silver patterns lessons will be taught Monday evenings in January in the Parish Hall of St. Stephen's Episcopal Church, second building north of Lily Flagg Road on Whitesburg Drive. Intermediate lessons will be from 7-8 p.m. and beginner lessons will be from 8-9 p.m. Cost will be $7 per person. For more information, call 650-0200.

Locker rental

The new fitness center on Digney Road is open. Current locker holders may select lockers through Jan. 25. After Jan. 25, all members will have the opportunity to rent remaining lockers.

Discount Bahamas vacation

Marshall team members are eligible for a discount Bahamas vacation which includes cruise from Ft. Lauderdale, Fla., to the Bahamas, and return to Florida, meals on board, and three nights' accommodations. Cost is $189 per person, double occupancy. For details, call Candy Bailey at 544-7565.

Thanks to everyone

I want to thank all the wonderful people who donated leave to me for this past year.

I had a pretty bad summer and fall. I went through two operations on my leg. But everything is finally healing right, I hope to be completely back on my feet by the end of January.

My family and I thank you all.

Your friend always,

— Tommy Harris, TD11

Employee Ads

Miscellaneous

★ Gig bag for acoustic guitar, new, $10. 337-6827/852-5481
★ Motorized electric wheelchair, almost new, Quickie G424, w/24V dual mode automatic battery charger, $3,000. 325-0300/772-3319
★ Utility trailer w/sides, dual axle, 6 1/2x16, $700; two large metal desks, $50 each. 539-4902
★ Radio controlled airplane, Tower Hobbies "Kaos;" Hitec radio, "Flash 5X," both new in box, $250 for all. (256) 837-9434
★ King-size flannel sheets, one set blue, one set brown, one set white with blue/brown leaves, $15 per set. 533-5942
★ Solid oak bedroom set, including queen/full headboard, large dresser/mirror, nightstand, chest of drawers, $750. 722-5282
★ Metal working shear, 48," $1,500; brake, 48," $250; Linde welder, 600A, wire-feed, $1,750. 880-0254
★ Iomega Zip drive, 100MB, new, and six zip disks, new, $100 for both. 837-0625
★ Franklin leather sectional, 3 piece, w/dual recliners and queen size hide-a-bed, hunter green, $1,250. 533-5942
★ Iomega Zip-100, internal drive, four zip disks, $100. (865) 406-6724
★ Little Tykes racecar toddler bed w/mattress, $70. 961-9441
★ Lazy-Boy living room sofa, floral pattern, mauves/pinks, blues, greens. 534-7981
★ Limestone window sills and headers, $75 each; Transferware, green, by Spode, six plates, $50. 882-1097
★ Blue Lazy-Boy double recliner couch, $100; brown Lazy-Boy recliner, $50; hot tub cover, never used, 84"x80", $50. (931) 438-4919
★ Pentium 3 PC, 650 Mhz, 56K modem, keyboard, mouse, $575 negotiable. 851-1854/leave message
★ Propane logs; fireplace insert; solid oak entertainment center; kerosene heater; 6' folding table. (256) 771-0797
★ Gasoline fuel nozzle operating lever holder, replaces a removed notched plate, $10. 232-1171
★ 2001 Jeep Wrangler factory side-steps, $20. 353-9891
★ Maternity clothes, size large. 837-7465
★ Learn Japanese software, $30; Infrared massager, $10; Greatest Story video, $10; Norton anti-virus 2001, $20. 722-9483
★ Firewood, $40 rick. 379-2020 after 4 p.m.
★ Sheldon belt-driven metal working lathe, 110V, 10" swing, 44" between centers, 3 & 4 jaw chucks, table included, $1,500. (205) 647-4949
★ SupraExpress 56k external modem for Mac, in box, $25. 882-1780
★ Basketball goal w/weighted base, 1 yr. old, $75 obo. 852-4406
★ Ovation Applause AE38 acoustic electric guitar; cherryburst, diamond inlays, binding, shallow bowl, $225. 325-1961
★ Modem, Hayes external, 56k, V.90, $25. 337-6827

Vehicles

★ 1993 Dodge Grand Caravan SE, one-owner, service records available, $3,995. 895-9520
★ 1978 C-10 work truck, 350 automatic, LWB, lock in hubs, 4x4, mileage unknown, $2,000. 837-6797
★ 1991 Mazda Miata, red, 5-speed, roll bar, 125K miles, $1,700 obo. (615) 828-2828
★ 1996 Nissan Sentra GXE, 4 cyl. auto, 140K miles, power windows/door locks, $3,950 obo. (256) 753-2278
★ 1996 Ford Explorer XLT, 112K miles, V-8, auto, 2WD, 4-door, tilt, cruise, PL/PW, $8,100. (256) 828-0618/796-2060
★ 2000 Saturn SL-2, silver/gray interior, CD/cassette player, power doors/windows, keyless entry, sunroof, 30K miles, $13,500 obo. (256) 652-2705
★ 1990 Ford Ranger XLT Super-cab, 4.0L V-6, auto, 15" tires, 163K miles, $2,900. (256) 880-2015
★ 1995 Ford Econoline conversion van, 68K miles, $9,250. 325-0300
★ 1987 Trans Am, new paint, wheels, tires, shocks, brakes. (256) 536-2433
★ 1999 Honda Accord, 2-door, V-6, auto, 39.5K miles, $15,500 obo. 536-3390
★ 1989 Mazda B2600i SE-5, 4x4, 2.6L, 4 cyl., PS, a/c, 5-speed, 131K miles, $3,200. (256) 859-9101
★ 1989 Grand Jeep Cherokee Laredo, gold package, 85K miles, $15,500. 518-9802
★ 1984 Corolla, working air and radio, needs fuel injector work, <200K miles, $400. 882-1880
★ 1985 GMC van, fully customized, $500. 851-9520
★ 1968 Super Sport; three 69 Camaros; 1981 Z28 T-top car; 1968 Firebird convertible; three trailers. 316-1880
★ 1997 Nissan Maxima SE, green/beige leather interior, auto, 64K miles, $12,000. 232-1940
★ 2001 GMC Jimmy SLS, 5-speed, V-6, take over payments. 858-5552
★ 1993 Thunderbird LX, one-owner, V-8, black/gray leather, rebuilt transmission, new a/c, high miles, $3,950. (256) 776-2274
★ 1986 GMC small truck, 4-cyl., 115K miles, a/c, radio, needs radiator & head gasket, $400. 882-2287
★ 1999 Ford Expedition XLT, 2WD, white/tan leather interior, 6 CD changer, 63K miles, one-owner, $19,995. 533-5942
★ 1995 Dodge Neon, sell as is, $2,000 firm; Panasonic KP2123 dot matrix printer, $25. 882-7084
★ 1993 Olds Delta 88 Royale, 175K miles, needs heater work, good tires/paint, $500 obo. 858-0700
★ 1992 Ford Explorer XLT, 4WD, 4-door, auto, power, towing package, one-owner, $4,600. 536-5420
★ 1997 Honda Accord, EX, dark green/tan interior, auto, 58K miles, new timing belt & tires, gold package, $12,500. (256) 536-4326
★ 1992 Honda Accord EX wagon, 150K miles, blue, 4 cyl., electric sun-roof, new Michelin tires, $4,900. 880-9487

Found

★ Like new tool box, Bldg. 4610 area. Call 544-7686 to claim/identify
★ Reading glasses, Bldg. 4200 Executive parking lot. Call 544-3623 to identify/claim
★ Pedometer at Bldg. 4752 on January 4. 544-2486

Wanted

★ Used sectional furniture, solid color, good to excellent condition, no animal smells. 682-5181
★ Used pickup topper for Nissan pickup truck, standard bed-size. 464-5774
★ Nintendo 64 unit, two controllers, games. 852-4406
★ Fish aquarium with stand, large size. 961-9655
★ Used Gameboy Color games in good condition. 722-0997

Free

★ Cat, 10 months old, to a good home, all accessories included. 536-8345

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